



# QUALITY IMPROVEMENT AND COMPETITIVENESS OF MODIFIED CASSAVA FLOUR (MOCAF) ACCOMPANIMENTS USING APPROPRIATE STIMULANT TECHNOLOGY

S Sundari<sup>1</sup> and A Ahsin Kusuma M<sup>2\*</sup>

<sup>1</sup>Department of Agribusiness Management, Jember State Polytechnic, Mastrip Road Po Box 164, Jember-Indonesia

<sup>2</sup>Department of Accounting, Jember University

\*ahsin.kusuma@yahoo.co.id

**Abstract.** Nowadays, Mocaf (modified cassava flour) is a kind of popular snack. It can be found in some souvenir or gift shop with various flavor. Mocaf snacks also consumed in casual condition or working time. Dian Nita is leading mocaf snacks production as an innovation of Modified Cassava Flour products in a simple method. Some issues were found before the partnership program such as mocaf dough was produced by manual method that only created small capacity with slow rate production; unattractive packaging design; short-time product durability; don't have P-IRT authorization; difficult to count the cost of goods manufactured and determine the sales cost that caused inaccurate to counting net profit from this mocaf business.

With this program the issues can be solved by (1) Implementing more efficient technology with multipurpose mixer to improve capacity and productivity; (2) Using modern oven that equipped with temperature control to make products maturity more distributed; (3) Redesign packaging and put information about expired date, P-IRT number and halal label; (4) Completing Business Registration Number, industrial business permit, and perform nutrition test; (5) Improving business management by applying small medium enterprises accountancy, upgrading the operational production method, market segment and marketing, both online and offline stores.

**Keywords:** Mocaf accompaniments, Processes technology, Product packaging

## 1. INTRODUCTION

Flour is one of the basic goods by Indonesian citizens. The flour was used as essential material for household needs and various food industries. Flour consumption was increased every year, especially several months before Eid and another commemoration day. According to Ratna Sari Lopis (2018), over the past year flour consumption recorded at 6,2 million tons, with 5,44% annual growth. Meanwhile, flour usage was dominated by small and medium-sized or *usaha kecil menengah* (UKM) enterprises with 66%-67%, the rest of the stocks were used in larger industries<sup>[1]</sup>. Price and stocks fluctuation were affected by the world market mechanism and low rates of national production. Households and industries said this is not a good condition to run foods

with mocaf materials.

Mocaf is the abbreviation of *Modified Cassava Flour* with fermentation technology using microbes. The characteristics of mocaf can substitute or replace the using of wheat flour. This mocaf is showed whiter and the cassava flavor was eliminated, therefore to substitute the wheat flour did not decrease the product quality as long as the proportions were adjusted with the product types (Salim, Emil, 2011) [2].

These days, people were increasing their awareness to look for a safe, healthy and less harmful food products or we also called it “back to nature”. It can conduct many food and snacks manufacturer to process the raw material from nature. Jember is the examples district with abundant mocaf stocks, by this year the district was improving mocaf flour as the substitutes for wheat flour. Mocaf flour utilization need an innovation to diversificates various snack products. This mocaf snacks is one of product diversificate methods to increasing the economic value of mocaf flour. Mocaf snacks production as the one of diversificate methods was established by Mrs. Dian Nita as the partner of Community Partnership Program or *Program Kemitraan Masyarakat* (PKM) in Kraton Village, Kencong District, although it was running for two years with simple method.

Some issues were found before the community partnership program for examples: (1) mocaf dough was produced by manual method using simple hand mixer that only created small capacity and with slow rate of production; (2) operation of simple oven with small capacity caused product maturity less distributed and the amount of products still inadequate; (3) unattractive packaging design, the packaging did not put out the expired date, short-time product durability and do not have P-IRT authorization; (4) do not have bookkeeping, affecting on difficulty to count the cost of goods manufactured and determine the sales cost that caused inaccurate to counting net profit from this mocaf business. Processing techniques and methods that implemented in this business were influent the products quality and the efficiency of production processes. Mocaf snacks requires more attention to processing techniques because it concerning the quality standards. Community Partnership Program need to look forward the real condition, potency and their partner's issues. Modern mixer machine and oven introduction to their partners could be improve the mocaf quality and processing management. As the business management refinements and bookkeeping improvements, Community Partnership Program accomplish to redesign the products packaging to be more attractive for consumers, business management training and conduct the bookkeeping based on simple Accountancy Standards, also accompaniment for online stores to accelerate the marketing processes. Mocaf it is cassava flour (*manihot esculenta crantz*) that processed using modification principle on cassava cells by fermentation where Lactic Acid Bacterias dominated during the process. The growing bacterias produce pectinolytic and cellulolytic enzymes to crush the cassava cell walls in certain condition that trigger the starch granules liberation. Those microbes also produced anzymes to hydrolyzed starch into glucose and then turning it to become organic acid, especially lactic acid. This condition causing alteration on the flour characteristics such as increasing viscosity, gelation ability, rehydration potency and dissolved ability. Likewise, mocaf flavor become neutral after covering cassava flavor up to 70% (Subagio, Achmad; Diniyah, Nurud. 2018) [3].

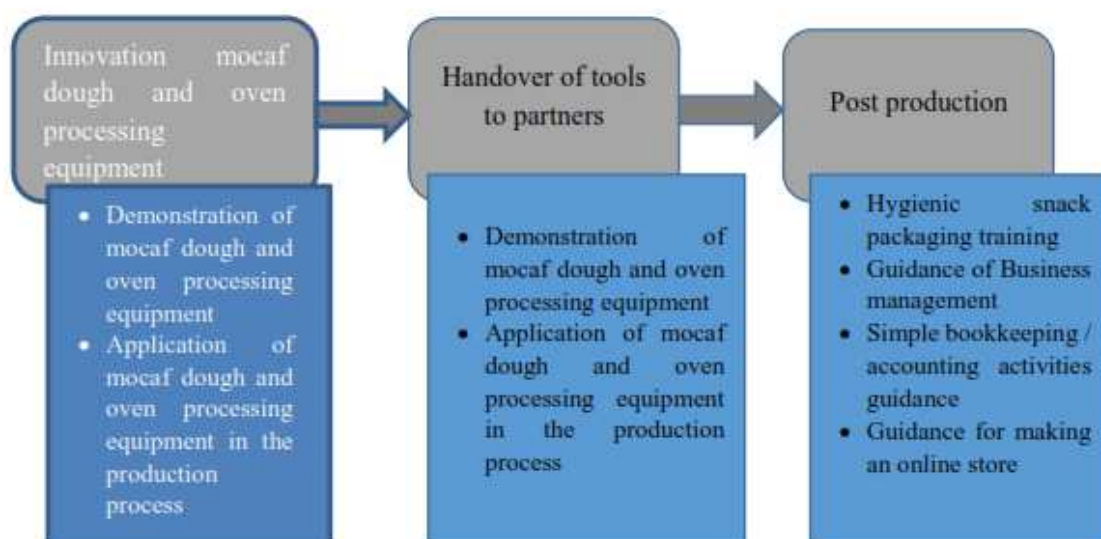
Mocaf flour showed a good improvement prospects in Indonesia. In the first terms, cassava stocks were abundant so that there is only small chance for products insufficiency because it does not depend on import like wheat stocks. In the second terms, the price of mocaf flour is cheaper than wheat flour or rice flour so that the production costs are less expensive than other flour [4].

The Purpose of PKM Activities are: (1) provides improvement opportunities for Micro, small and medium enterprises (MSMEs) home industry based on agribusiness; (2) Production capacity improvement for PKM partners; (3) Increasing competitiveness of MSMEs home industry products; and (4) Utilize the appropriate technology for PKM partners.

## 2. Community Partnership Program Method

Based on partners real issue of PKM, the potential, condition, and mutual agreement, alternative technology that can be applied are: mocaf batter mixer machine; mocaf snack oven machine; enhancement of productivity and product's quality; improvement of product's packaging design; bookkeeping application based on Simple Financial Accounting Standard; assistance on online-store establishment.

The applied method on PKM partners is **Training and Practice** method, where PKM do more activities, both training aspect, skill, or independent activities. The following picture (Figure 1) is an application method of community partnership program activity in Kraton Village, Kencong District.



**Figure 1.** The Application Method of Community Partnership Program, Mocaf Snack Business Group in Kraton Village, Kencong District

The realization of the application of PKM activity involves mocaf snack's entrepreneurs in Kraton Vilage, Puger District, as an activity partner, where partners have to participate in every PKM activity, and one entrepreneur directly involved as the facility provider, as well as event organizer and group coordinator. The community partnership program activity that held in MSMEs D'Kaokao owned by Mrs. Dian Nita in Kraton Vilage, Kencong District as PKM partner, is still making by using simple method and only followed by her family members and her 3 employees. 5 people were evolved in this community partnership program, are expected to spread the results of this activity to other target audience. The method that applied in this activity are: (1) discussion with partners about the characteristics of cassava as one of the agribusiness products, its benefits for health and the nutritional content that processed into mocaf flour; (2) manufacture of mocaf-based product, bron cocaf, mocaf bread, and product acceptance test in the community; and (3) developing home industries by assisting MSMEs partners, such as: explanation about cost accounting in determining selling prices; explanation about packaging requirements, label, and PIRT marketing authorisation; explanation about production standardization requirements for home industries to sell their products in wider community (hygiene sanitation, license of home industry establishment, industrial business license); and explanation about the use of appropriate technology related to the improvement of the quality and competitiveness of mocaf-based snacks with stimulants for the application of appropriate technology.

## 3. Result and Discussion

Discussion activities in the implementation of community partnership program discussed about: (1) The procurement of mocaf raw materials, that consist of determining the supplier, selecting the materials, and storage of the materials; the discussion topic of handling the materials is necessary so partners can

understand about the importance of handling raw materials in accordance to product's quality. Mocaf requires quick handling to avoid the damage; (2) Technical aspects of production operation are related to the technique of using the mixer and oven machine, factory layout, hygiene sanitataion, packaging, labeling, and product's warehousing technique. Product handling includes mixing, weighing, and storage. Hygiene sanitation includes personal hygiene, clothes, work environment, and equipment. Cleanliness when handling raw materials is very important to be considered to provide safe and clean products. Packaging is related to selection of packaging type, the equipment that suits the packaging type. This topic is given the information about how to choose the right packaging in accordance to the product, the right equipment and how to operate the equipment so the packaging result can protect the products and make the shelf-life longer; (3) Legal aspect includes the management of Business Entity Number, P-IRT distribution permit, industrial business permit, halal label, and nutritional test, labeling discussion to know the requirements about the information that must be included in the food label based on food label regulations. Theory about food certification, especially Dinkes P-IRT and BP-POM. Discussion with PKM partner can provide an overview and information about the types of products that can be certified and not certified by Dinkes, but through BP-POM. In addition, an explanation was also given in accordance to the requirements for certification submission and certification procedures; (4) Financial aspects includes the introduction of cost accounting in determining the selling price, the application of accounting system, discussion about determining the selling price is intended so partners can have an overview about how to determine the selling price and can be applied in other products; and (5) Market aspects and products marketing includes: targeting, segmenting, positioning, and marketing mix. The theory and practical application about marketing strategy and how to engage market as an overview to determining the right marketing methods to mocaf based products.

The physical and chemical character of mocaf flour is similar to wheat flour. This is potential to be develop to product's diversification so mocaf flour can reduce the dependency on wheat flour, while optimally utilizing local potential, cassava. Some products that can be produce are wet brownies snacks, dry chocolate brownies, steamed brownies, cocaf bread, dumplings, pastries, cake, and dried pastels. The diversification of mocaf based snacks was evaluated for its competency in terms of making diversification of mocaf based products, with the following criteria: (a) percentage of the use of mocaf ingredients in the manufacture of various snacks, i.e the higher the percentage of mocaf compared to other flour, the better the value; (b) processing technique, related to the use of creative and innovative processing techniques. The ability to perform various technique outside the reffered recipes; (c) taste, the taste accuracy according to the products result; (d) aroma; (e) texture, soft taste, crunchy/cripsy, and gritty; and (f) colour, the accuracy on chosing the right colour combination of the products. Considering the percentage criteria of the mused of mocaf-based products, processing technique, flavor, aroma, colour, and packaging, it can be seen that diversification of the products that have the criteria as mocaf-based snacks are wet brownies, dry chocolate brownies, steamed brownies, cocaf

bread, dumplings, pastries, cakes, and dry pastels.

## 4. CONCLUSION AND SUGGESTIONS

### 4.1 Conclusion

1. Diversification of mocaf flour-based products is done by processing the mocaf flour into wet brownies, dry chocolate brownies, steamed brownies, cocaf bread, dumplings, pastries, cake, and dry pastels that have 3 month's shelf-life.
2. The opportunity to develop open home industries is by the competitive selling prices.

### 4.2 Suggestion

Advance Community Service is needed to improve mocaf based-product's quality in MSMEs D'kaokao and development of product through diversification of mocaf-based products as the region's featured product.

**Acknowledgements**

Thank,s for Ministry of Technology Research & Higher Education, Directorate General of Research & Development Strengthening, Director of Research & Community Service, who have given funds so Community Partnership Program can be held well.

**References**

- [1] Lopis R S 2018 Konsumsi Tepung Terigu Bakal Naik 5%  
<http://industri.bisnis.com/read/20180125/257/730484/konsumsi-tepung-terigu-bakal-naik-5>

- [2] E Salim 2011 Mengolah Singkong Menjadi Tepung Mocaf *LILY PUBLISHER* Yogyakarta
- [3] A Subagio and N Diniyah 2018 Effect of Fermentation Time and Cassava Varieties on Water Content and the Yield of Starch from Modified Cassava Flour (MOCAF) *Indonesian Journal of Pharmaceutical Science and Technology* Vol 5, No.2, 71-75
- [4] [www.agroindustri.id/karakteristik-dan-tepung-mocaf/](http://www.agroindustri.id/karakteristik-dan-tepung-mocaf/)). Mengenal Karakteristik dan Keunggulan Tepung Mocaf.